



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants :	Anthony J. Ruggiero	Docket No. :	IL-10610
Serial No. :	09/827,454	Art Unit :	2633
Filed :	April 6, 2001	Examiner	Christina Y. Leung
For :	Remotely-Interrogated High Data Rate Free Space Laser Communications Link		

Commissioner for Patents  
Alexandria, VA 22313-1450

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on July 20, 2004  
April Masluk

April Masluk Technology Center 2600

Honorable Commissioner for Patents  
Alexandria, VA 22313-1450

Attention: Board of Patent Appeals and Interferences

Dear Sir:

APPELLANT'S REPLY BRIEF (37 C.F.R. § 1.193)

This Reply Brief is submitted in response to the "Examiner's Answer." The Examiner's Answer was mailed May 20, 2004. Appellant's Reply Brief is submitted in triplicate.

### Obviousness Rejections Under 35 U.S.C. §103(a)

The Examiner has made an obviousness rejection under 35 U.S.C. §103(a) for each claim at issue by utilizing one or more of the references Akkapeddi (US 4,949,056A), Sharp et al (US 5,317,442A), Pepper et al (US 5,038,359A), MacDonald (US 5,519,723A), Damen et al (US 5,675,436A), and Watanabe (US 5,920,588), in combination with Vasil'ev et al "Phase-conjugation broad area twin-contact semiconductor laser." Applied Physics Letters, vol. 71, no. 1, 07 July 1997, pp. 40-42. The Appellant has filed an Appeal Brief on February 24, 2004, which addresses each of the Examiner's arguments.

To summarize, the Appellant respectfully submits that it would not be obvious to combine the references as submitted by the Examiner. The Examiner throughout her answer mailed 05/20/04 states either that (e.g., see page 7, line 7) "it would have been obvious to a person of ordinary skill in the art....as an engineering design choice" to make the combination or (e.g., see page 9, line 6) "that one in the art would have been particularly motivated to incorporate the teachings" of the combination or (e.g., see page 11, lines 9-11) "[t]he claimed differences exist not as a result of an attempt by appellant to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art."

The Appellant submits that the Examiner is in error in her interpretation of the combination of the references, specifically, the Vasil'ev et al document entitled "Phase-conjugation broad area twin-contact semiconductor laser." The authors in

Vasil'ev et al<sup>o</sup> demonstrate the generation of a self-pumped non-collinear four wave mixing signal inside of a broad area semiconductor laser diode (SLD) (ie. a diode laser that lacks lateral confinement) in an external cavity configuration. The self-pumped four wave mixing signal is generated in a 'spatially non-degenerate configuration" in other words at an angle with respect to the pump beams so that it can be separated from the pump beams and fed back from an external mirror. Self-seeding of this type is a means to control the longitudinal mode characteristics (operating frequency characteristics) of a laser. The arrangement described in this paper exploits the *temporal phase conjugation* properties of the four-wave mixing process. By using the semiconductor device as a phase conjugate mirror in this way there is the potential to make the external cavity laser system more robust to external *cavity length changes* (drift in external cavity resonance frequency) and *one-dimensional* spatial fluctuations in the plane of the broad area device.

Such an arrangement, as described in Vasil'ev et al, provides no rational motivation or engineering design choice as stated by the Examiner to combine Vasil'ev with, for example, Akkapeddi and Sharp, which generates a true *two-dimensional* spatial phase conjugate of the input probe beam so as to correct for atmospheric turbulence. To do so would destroy the functionality of Akkapeddi and Sharp. In fact, on page 42, in the second to last paragraph of the article, the authors in Vasil'ev et al state, "It should be noted that strictly speaking the "conjugate "signal generated is not the "phase conjugate" of the input beam, because of the "filtering" action of the waveguide of the

SLD. In view of this SLD's [of this type] are not truly suitable for turbulence aberration correction....."

Moreover, there is no rational motivation nor a rational engineering design choice to combine Vasil'ev et al with, for example, the reference Watanabe, which is concerned with removing the effects of chromatic dispersion and pulse distortion, not for producing a spatially conjugated beam.

Accordingly, Appellant respectfully submits that, in accordance with the detailed arguments filed in the Appeal Brief on February 24, 2004, there is no suggestion or motivation to combine the references cited by the Examiner to properly form a rejection under 35 U.S.C. §103(a) for claims 1-49.

No Statement Identifying the Related Appeals and Interferences

On page 2 of the Examiner's answer, the Examiner states that, "the brief does not contain a statement identifying the related appeals and interferences." Appellant submits that such a statement is contained in Appellant's brief.

On page 3, under Roman Numeral II, entitled RELATED APPEALS AND INTERFERENCES, of the Appellant's brief, the Appellant states, "Appellant is unaware of any related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal."

In light of such a statement, the Appellant submits that the Appellant's brief does have the requisite statement. Therefore, the issue is rendered moot.

Inclusion of the Reference Pepper et al, RE: claims 18, 19, and 21

On page 2, under item 6 of the Examiner's answer, the Examiner states that, Section "C" in appellant's statement of the issues in the brief should not include Pepper et al. (US 5,038,359 A)." Appellant submits that there is no reference to Pepper et al in section C.

On page 16, under Section C, entitled, "Appellant's claims 18, 19, and 21 are Not Obvious over Akkapeddi in view of Vasil'ev et al," the Appellant states, "Similarly, for the reasons developed in Section A." In section A, Appellant detailed arguments as to why it was improper to combine Akkapeddi and Vasil'ev et al to form a 35 U.S.C. §103(a) rejection. While section A did discuss the reference Pepper et al, Appellant's comments in section C does not explicitly or impliedly suggest including Pepper et al. (US 5,038,359 A) as evidenced by the title of Section C.

Accordingly, the issue is submitted as being rendered moot.

SUMMARY

It is respectfully requested that all of the claims on appeal (i.e., claims 1-49) be allowed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Michael C. Staggs', is written over a horizontal line.

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Dated: 7/20/04